

GAO

Report to the Chairmen, Committees on
Appropriations, House of Representatives
and U.S. Senate

March 1989

TRAINER AIRCRAFT

Plans to Replace the Existing Fleet





United States
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The Honorable Robert C. Byrd
Chairman, Committee on Appropriations
United States Senate

The Honorable Jamie L. Whitten
Chairman, Committee on Appropriations
House of Representatives

In April 1988 the Department of Defense submitted a report to the Congress that contained a master plan for meeting future requirements of the Air Force for Undergraduate Pilot Training. The fiscal year 1989 defense appropriation conference report directed us to evaluate the plan. This report summarizes the results of our review.

We are sending copies of this report to the Chairmen, House and Senate Committees on Armed Services; the Secretaries of Defense and the Air Force; the Director, Office of Management and Budget; and other interested parties upon request.

This report was prepared under the direction of Harry R. Finley, Director, Air Force Issues. Other major contributors are listed in appendix II.

Frank C. Conahan
Assistant Comptroller General

Executive Summary

Purpose

Undergraduate pilot training is the initial phase of Air Force pilot training and is designed to provide students with the basic skills needed for subsequent training in specific operational aircraft.

In April 1988 the Department of Defense submitted a report to the Congress that contained a master plan for meeting the Air Force's requirements for undergraduate pilot training into the early 21st century. The House and Senate Committees on Appropriations requested GAO to assess the Air Force's master plan. GAO was asked to review the alternatives considered by the Air Force, the validity of the cost comparison data, and the soundness of the recommendations.

Background

Undergraduate pilot training is conducted in three phases. First, the students begin the introductory ground phase, lasting 3 weeks, in which they receive physiological training, flight-related studies, and ejection seat/parachute training. Next, the students move to the primary training phase, lasting about 21 weeks, in which they receive fundamental flight instruction both in the classroom and in the T-37 trainer aircraft. Last, the students move into an advanced phase, lasting about 28 weeks, in which they receive additional academics and learn to fly the more advanced T-38 aircraft.

Under the current system, all students, for the most part, receive the same training regardless of the aircraft they will ultimately fly when they are assigned to their operational units.

The Air Force is proposing to separate the current system into two specialized tracks, one for students who will eventually fly tanker or transport aircraft and the other for students who will eventually fly fighter or bomber aircraft. Thus, students would receive specialized training during the advanced phase that is more compatible with the aircraft they will likely fly when assigned to their operational units.

The Air Force believes that this dual-track system will provide a more highly trained graduate who is better able to make the transition into follow-on aircraft, particularly for those graduates who will fly multiengine heavy aircraft, such as the C-5, C-141, or KC-10. The modified training system calls for replacing the T-37 and T-38 aircraft with three new types of trainer aircraft with an estimated acquisition cost of \$6.9 billion.

Results in Brief

According to Air Force officials and documents, the cost analysis in the master plan contains a degree of uncertainty and is meant to provide order of magnitude cost estimates. Thus, because of the closeness of the costs of the dual-track and single-track alternatives, neither is a clear choice over the other from a cost perspective.

Although cost was considered in the Air Force's decision to move to a dual-track system, anticipated improvements in the quality of pilot training, the perceived need to address operational and training deficiencies with existing aircraft, and the desire to increase pilot production capacity were also key, if not overriding, considerations.

For some time, the Air Force has wanted to establish a dual-track system for undergraduate pilot training and have aircraft that are modern and more compatible with the types that graduates will fly when they are assigned to their operational units. It also wants to increase its surge capability.

The current fleet of T-37s and T-38s, when modified, should meet current levels of pilot production, with some surge potential, for at least the next 8 years. The Air Force could, therefore, delay initial funding for 5 years, allowing 3 years from initial funding to receipt of a T-38 replacement aircraft and reduce budget requirements over that period by almost \$1 billion.

Principal Findings

Uncertainty in Air Force Cost Estimates

The master plan shows an estimated life-cycle cost for a dual-track system of \$17.9 billion and for a single-track system of \$18.8 billion. It also recognizes that because some proposed scenarios did not require aircraft procurement for many years, there was a great deal of uncertainty in estimating acquisition costs.

When the Air Force developed fuel costs and maintenance manhours per flying hour for the T-38 replacement, it assumed a flat 30-percent improvement over current T-38 fuel consumption and a 25-percent improvement over current T-38 maintenance manhours per flying hour. According to Air Force officials, the improvement in fuel consumption is

based on knowledge of aircraft engine fuel efficiency trends and professional judgment, whereas the improved maintenance manhours per flying hour is based on reduced maintenance requirements due to advances in technologies. While the estimates may be reasonable, the fact that they were based on flat percentage improvements over existing aircraft illustrates the general nature of the cost analysis and its lack of preciseness.

T-37 and T-38 Service Life Extension Programs

The Air Force plans to initiate a program to extend the useful life of its T-37 aircraft. When completed, the Air Force expects the T-37 to meet its training requirements and remain airworthy past the turn of the century.

In fiscal year 1986 the Air Force began a 10-year modification program to extend the life of its T-38 aircraft. According to the Air Force, the T-38, once modified, will support pilot production at current levels until 1996. Over 600 T-38 aircraft are expected to be airworthy past the turn of the century.

Although the modification programs will extend the life of the existing aircraft, the Air Force plans to replace both aircraft before the end of their flyable life.

Increased Surge Capability

If the Air Force could increase its utilization rate for the T-38 aircraft, reduce its requirements for backup aircraft as it completes its T-38 modification program, and continue the low attrition rates it has experienced over the last 5 years, it should increase its surge capability.

According to Air Training Command officials, the Command has experienced a reduction in the availability of spare parts within the last year, which has had a direct effect on the availability of aircraft.

Agency Comments

DOD partially concurred with GAO's findings. DOD acknowledged that the existing fleet, when modified, will remain airworthy at least until the turn of the century. But, because of the qualitative and other improvements in training that may be realized with the replacement aircraft, DOD does not believe that their replacement should be delayed. It also stated that delaying acquisition of new aircraft would eliminate the ability to increase pilot production, continue the heavy training load on the T-38 aircraft, and delay replacing the T-37, which is reaching the end of

its useful life. DOD added that delaying new acquisitions would result in the Air Force having to replace two training aircraft at the same time in the mid-1990s, which would not be affordable.

GAO recognizes that delaying acquisition of new aircraft would limit the extent to which the Air Force could increase its pilot production, if necessary. However, the existing fleet, when modified, should provide some surge capability for at least the next 8 years. Additionally, if the T-37 and T-38 aircraft are not replaced, they will continue to incur the load that they have in the past. Yet, at these levels, the aircraft will remain airworthy past the turn of the century. GAO agrees that starting two major acquisition programs at or near the same time could significantly increase the procurement funding requirements of the Air Training Command during that period; however, it would not have as much of an impact Air Force-wide.

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Abbreviations

AFB	Air Force Base
ASUPT	Alternate Specialized Undergraduate Pilot Training
ATC	Air Training Command
ATTS	All-Through Training System
BAA	backup aircraft authorization
DOD	Department of Defense
GAO	General Accounting Office
MUPT	Modernized Undergraduate Pilot Training
SUPT	Specialized Undergraduate Pilot Training
UPT	Undergraduate Pilot Training
UTE	utilization rate

Introduction

In April 1988 the Department of Defense (DOD) submitted a report to the Congress that contained a master plan for meeting the Air Force's requirements for Undergraduate Pilot Training (UPT) into the early 21st century. The report recommended that the Air Force modify its current training system for conducting UPT and acquire three new types of trainer aircraft, totaling 1,166 aircraft. The cost of the program over 24 years is estimated at \$17.9 billion and includes \$6.9 billion (in 1987 dollars) to acquire the three new aircraft. The master plan was approved by the Chief of Staff of the Air Force, the Secretary of the Air Force, and the Under Secretary of Defense for Acquisition.

The conferees on the fiscal year 1989 defense appropriations bill agreed to provide \$9.6 million for the Air Force to begin acquisition of the first of the three types of aircraft. However, the conference report also said that the funds could not be obligated until the House and Senate Committees on Appropriations review our assessment of the Air Force's master plan.

Background

UPT is the initial phase of Air Force pilot training and is designed to provide students the basic skills needed for further training in specific operational aircraft. It is one of several phases in the pilot development process. Graduates of UPT need additional training and flight experience before they can be deemed mission qualified.

UPT is conducted in three phases. First, the students begin the introductory ground phase, lasting about 3 weeks, in which they receive physiological training, flight-related studies, and ejection seat/parachute training. Next, the students move to the primary training phase, lasting about 21 weeks, in which they receive fundamental flight instruction both in the classroom and in the T-37 trainer aircraft (see fig. 1.1). Last, the students move into an advanced phase, lasting about 28 weeks, in which they receive additional classroom instruction and learn to fly the more advanced T-38 aircraft (see fig. 1.2). UPT provides all fixed-wing pilots with the training to meet the Air Force's bomber, tactical, tanker, transport, and trainer requirements. Except for the final few weeks of UPT, all students receive the same training, regardless of their ultimate assignments.

Figure 1.1: T-37 Trainer Aircraft

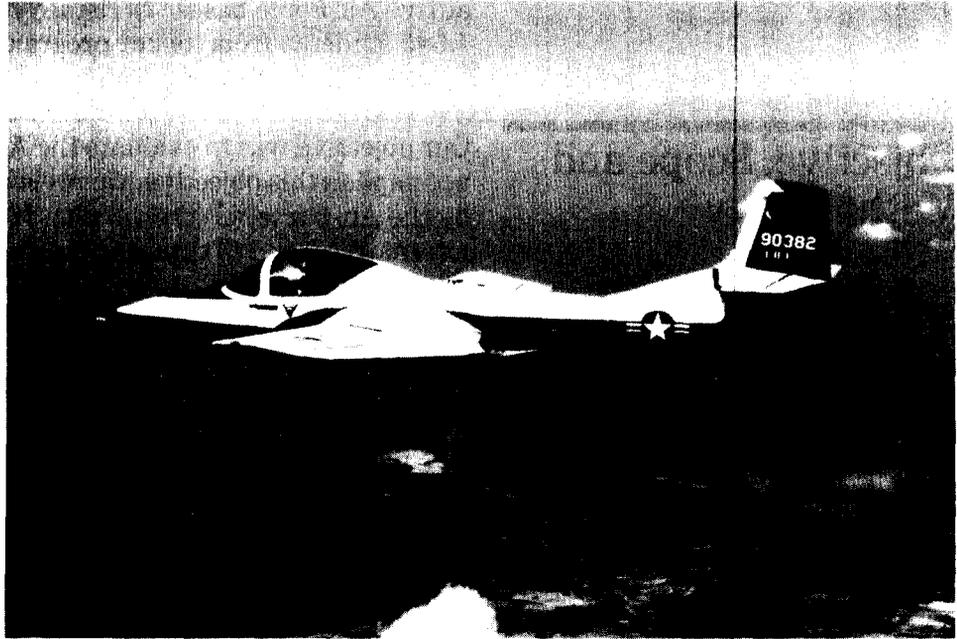
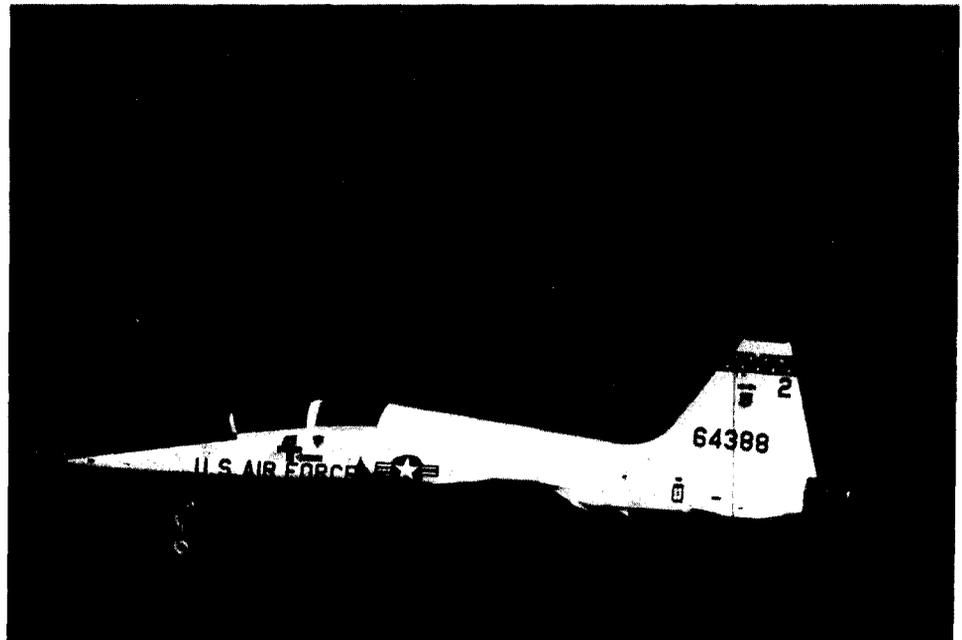


Figure 1.2: T-38 Trainer Aircraft



UPT is managed by the Air Force's Air Training Command (ATC), located at Randolph Air Force Base, Texas. UPT training is conducted primarily

at five Air Force bases.¹ In fiscal year 1988 the Air Force graduated 1,542 students from its UPT program.

Objective, Scope and Methodology

Our objective was to evaluate the Air Force's trainer master plan. To accomplish this objective, we reviewed (1) the alternatives considered by the Air Force, (2) the validity of the cost comparison data for those alternatives, and (3) the soundness of the recommendations.

To accomplish our objective, we reviewed files and other documentation supporting the master plan. We identified the key factors determining life-cycle costs and learned how the Air Force arrived at those factors. We reviewed the supporting data, where available. We were limited in our ability to ascertain the reasonableness of the cost estimates contained in the master plan because documentation supporting these estimates were not prepared.

We also spoke with Air Force Headquarters officials and ATC officials responsible for operations, logistics, requirements, and financial matters. We reviewed ATC studies conducted between 1972 and 1987 that addressed UPT requirements and alternatives.

We conducted our review between October and December 1988 in accordance with generally accepted government auditing standards.

¹The five bases that conduct UPT are Vance Air Force Base (AFB), Enid, Oklahoma; Williams AFB, near Phoenix, Arizona; Columbus AFB, Columbus, Mississippi; Reese AFB, near Lubbock, Texas; and Laughlin AFB, Del Rio, Texas.

Alternatives Considered by the Air Force

The Air Force considered four alternatives for meeting its future requirements for UPT. Although the alternatives differed in how UPT objectives would be met, each alternative assumed

- that programs to extend the life of its current fleet of T-37 and T-38 aircraft would be completed;
- the need to replace the existing fleet of T-37 and T-38 aircraft, beginning as early as 1990;
- an increase in pilot output capacity to 1,890, which is about 10 percent above the current level of pilot output;
- an increase in flying hours per student from 81 to 89 for primary training and an increase from 109 hours to 119 hours for advanced training; and
- that acquisition of new type aircraft would be spaced so that only one type would be acquired at a time.

Alternative one, called Specialized Undergraduate Pilot Training (SUPT), provides for separating UPT into two specialized tracks, one for students who will eventually fly tanker or transport aircraft and the other for students who will eventually fly bomber or fighter aircraft. This alternative provides for (1) replacing over 200 of the existing T-38 aircraft, beginning in fiscal year 1990, with a new modified commercially available business jet for use in the tanker/transport track,² (2) replacing existing T-37 aircraft, beginning in fiscal year 1998, with another commercial aircraft for use by all students during the primary training phase, and (3) acquiring a third aircraft, beginning in fiscal year 2002, to replace the remaining T-38s used for the bomber/fighter track.

Alternative two, called Modernized Undergraduate Pilot Training (MUPT), retains the current single-track, two-aircraft system and provides for replacing the T-38 beginning in fiscal year 1992 and the T-37 beginning in fiscal year 1998.

Alternative three, called All-Through Training System (ATTS), retains the single-track UPT system but replaces the T-37 and T-38 aircraft, beginning in fiscal year 1992, with a single aircraft that is capable of handling both the primary and advanced phases of training.

²DOD stated that the T-38s will not be replaced on a one-for-one basis. It added that the exact number of T-38s needed to perform the advanced training mission in the bomber-fighter track is still being analyzed.

Alternative four, called Alternate Specialized Undergraduate Pilot Training (ASUPT), provides for moving to a dual-track training program, initiating the acquisition of a new aircraft for the tanker/transport track, as in alternative one, beginning in fiscal year 1989, and replacing the T-38 used for the bomber/fighter track and the T-37 used in the primary track with a single aircraft capable of handling both primary and the bomber/fighter advanced track beginning in fiscal year 1998.

Conclusion of the Air Force's Analysis

The Air Force concluded that alternative one (SUPT) provides the highest quality graduate for the lowest expenditures in procurement, operations, and support, and it is expected to reduce the demand on the major commands for follow-on transition training to operational aircraft.

Cost of the Air Force's Alternatives

Table 2.1 compares the Air Force's estimates of the acquisition and life-cycle costs of the four alternatives. Figure 2.1 shows the Air Force's acquisition strategy under its proposed SUPT alternative.

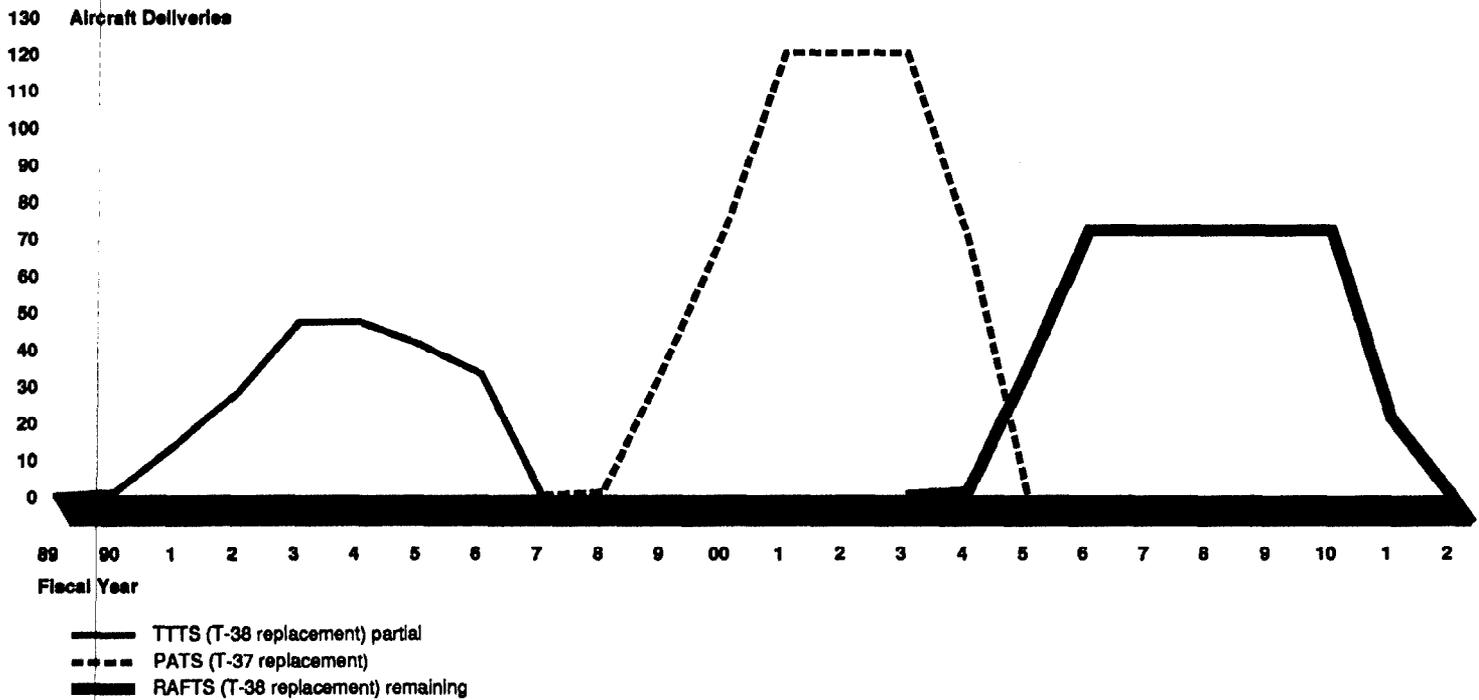
Table 2.1: Cost of Air Force Alternatives

In billions of fiscal year 1987 dollars

Alternative	Acquisition costs	Operations and support costs (24 years)	Total costs
SUPT	\$6.86	\$11.08	\$17.94
MUPT	7.72	11.04	18.77^a
ASUPT	8.73	12.42	21.15
ATTS	9.25	12.94	22.19

^aTotal does not add due to rounding.

Figure 2.1: Air Force Acquisition Strategy Under SUPT



Qualitative Considerations

Although cost was considered in the Air Force's selection of SUPT, anticipated improvements in the quality of pilot training, the perceived need to address operational and training deficiencies with existing aircraft, and the desire to increase pilot production capacity were also key, if not overriding, considerations.

Improving Quality of Pilot Training

The Air Force believes that the dual-track system will provide a more highly trained graduate who is better able to make the transition into follow-on aircraft, particularly for those graduates who will fly multiengined heavy aircraft, such as the C-5, C-141, or KC-10. Even though over one-half of UPT graduates are eventually assigned to tanker or transport aircraft, they receive advanced UPT training in the T-38, which is a fighter-type airplane. A dual-track system is expected to provide students who will eventually fly multiengined aircraft with increased emphasis on those skills they need to make a more easy transition to the heavier aircraft.

The Air Force has reviewed its UPT mission several times over the past 17 years. Several studies have concluded that a dual-track system would provide a more highly trained graduate than the current single-track system, particularly for those students who will eventually be assigned to the heavy, multicrew, multiengine aircraft. However, current plans call for students who will be assigned to bomber aircraft upon graduation to be in the same track as the fighter pilots and trained in the T-38. This is a major change in philosophy from earlier plans, in which these students would be trained in the same track as future tanker and transport pilots. According to the Air Force, students who will fly the new bomber aircraft, such as the B-2, will need many of the same skills as fighter pilots.

Operational Deficiencies of Existing Aircraft

According to the Air Force, both the T-37 and T-38 aircraft were designed using technology from the 1950s and still operate with avionics and airframe systems reflecting the old aviation designs of that period. Over the years, technological improvements to the T-38 have been incorporated, but the Air Force believes that the existing T-37 and T-38 aircraft do not adequately prepare students for the operational environment of the future and the cockpits of more sophisticated and advanced aircraft. In addition, it believes the existing T-37 and T-38 aircraft have the following operational deficiencies:

T-37 operational deficiencies

- difficulty in operating the aircraft safely when one of its two engines fails
- limited ejection capabilities—its ejection capabilities are less than ideal at low speeds and altitudes
- excessive engine noise
- lack of a pressurized cockpit, which limits the altitude and usable airspace of the aircraft
- limited range due to high fuel consumption

T-38 operational deficiencies

- the engine's susceptibility to foreign object damage
- the aircraft's inability to operate in icing conditions

Increasing Pilot Production Capacity

According to the master plan, ATC must be able to produce sufficient numbers of trained pilots to sustain the continuing needs of the Air Force's operational forces. To ensure that ATC is able to meet all reasonable training contingencies, the Air Force proposes to buy sufficient aircraft for a maximum fixed-wing production capacity of 1,890 pilots at the five bases that conduct UPT. Although yearly production goals fluctuate, on the basis of actual long-term Air Force needs, the 1,890 production capability will enable ATC to increase its pilot production by about 10 percent over current production goals, according to the master plan.

Changes to the Master Plan

On February 15, 1989, DOD issued an updated trainer aircraft master plan. This plan responded to the conference report on the national defense authorization act for fiscal year 1989 which directed the Air Force to submit a report to the House and Senate Committees on Armed Services outlining a plan that will lead to the Navy and the Air Force procuring similar aircraft. The report acknowledges the benefits of joint procurement and identifies future joint procurement opportunities. It also discusses a memorandum of understanding between the Air Force and the Navy concerning cooperation in the development and acquisition of future trainer aircraft. However, the DOD report also concludes that the Air Force should proceed as planned with its initial replacement of the T-38 aircraft. DOD does not consider the Air Force's purchase of the Navy T-45 in the 1994 time frame appropriate.

Conclusions

For some time the Air Force has wanted to establish a dual-track system for UPT and have aircraft that are modern and more compatible with the types that UPT graduates will fly when they are assigned to their operational units. It also wants to increase its pilot production capability, if needed.

A key assumption in the four alternatives examined in the master plan is the need to begin replacing the Air Force's existing fleet of T-37 and T-38 aircraft as early as fiscal year 1990. This assumption precludes considering an alternative of not buying any new aircraft until the current fleet approaches the end of its flyable life (see ch. 4).

DOD Comments

DOD said that the Air Force considered the alternative of not buying new aircraft until the current fleet approaches the end of its useful life, but

determined them not to be viable.(Discussion of the Air Force's reason for its determination is summarized on p. 25.)

Validity of Cost Comparison Data

According to Air Force officials and documents, the cost estimates in the master plan are meant to establish relative rankings among the alternatives and are not designed to be precise estimates. Also, some of the Air Force's future aircraft requirements are not well defined; as a result, they do not lend themselves to precise cost estimates. Thus, because of the closeness of the costs of the dual- and single-track alternatives, neither is a clear choice over the other from a cost basis.

Uncertainty in Air Force Estimates

According to Air Force officials and documents, the cost analysis in the master plan contains a degree of uncertainty and is meant to provide only order of magnitude cost estimates. Also, T-37 and T-38 replacement aircraft are not well defined; thus, they do not lend themselves to precise cost estimates. For example, ATC estimated the aircraft acquisition cost for the T-38 replacement on the Navy's T-45 cost estimates. The cost estimates were based on projecting additional Air Force buys of 300, 600, and 1,200 aircraft onto the present Navy buy of 300 aircraft. However, the options in the master plan call for the acquisition of 417 (SUPT), 738 (MUPT), 1,100 (ASUPT), and 1,421 (ATTS) aircraft. Such a variance in actual aircraft procured may have an impact on the actual price per aircraft. In turn, this could have an impact on the cost of the various alternatives.

When the Air Force developed fuel costs and maintenance manhours per flying hour for the T-38 replacement, it assumed a flat 30-percent improvement over current T-38 fuel consumption and a 25-percent improvement over current T-38 maintenance manhours per flying hour. According to Air Force officials, the improvement in fuel consumption is based on knowledge of aircraft engine fuel efficiency trends and professional judgment, whereas the improved maintenance manhours per flying hour is based on reduced maintenance requirements due to advances in technologies. Even though the estimates may be reasonable, the fact that they were based on flat percentage improvements over existing aircraft illustrates the general nature of the cost analysis and its lack of preciseness.

The above examples are intended to illustrate Air Force statements to us that no attempt was made to establish preciseness. Indeed, given the uncertainty in specifying some of the aircraft it plans to buy, preciseness is not possible. As a result, because of the closeness of the costs of the dual-and single-track alternatives, neither is a clear choice over the other from a cost basis.

DOD Comments and Our Analysis

DOD acknowledges that its estimates of fuel costs and maintenance man-hours per flying hour are less accurate than actual data, but it stated that there are no systems to use as a baseline.

The purpose of this chapter was to provide an understanding of the degree of precision in the Air Force's analysis; however, we recognize that preciseness is not possible.

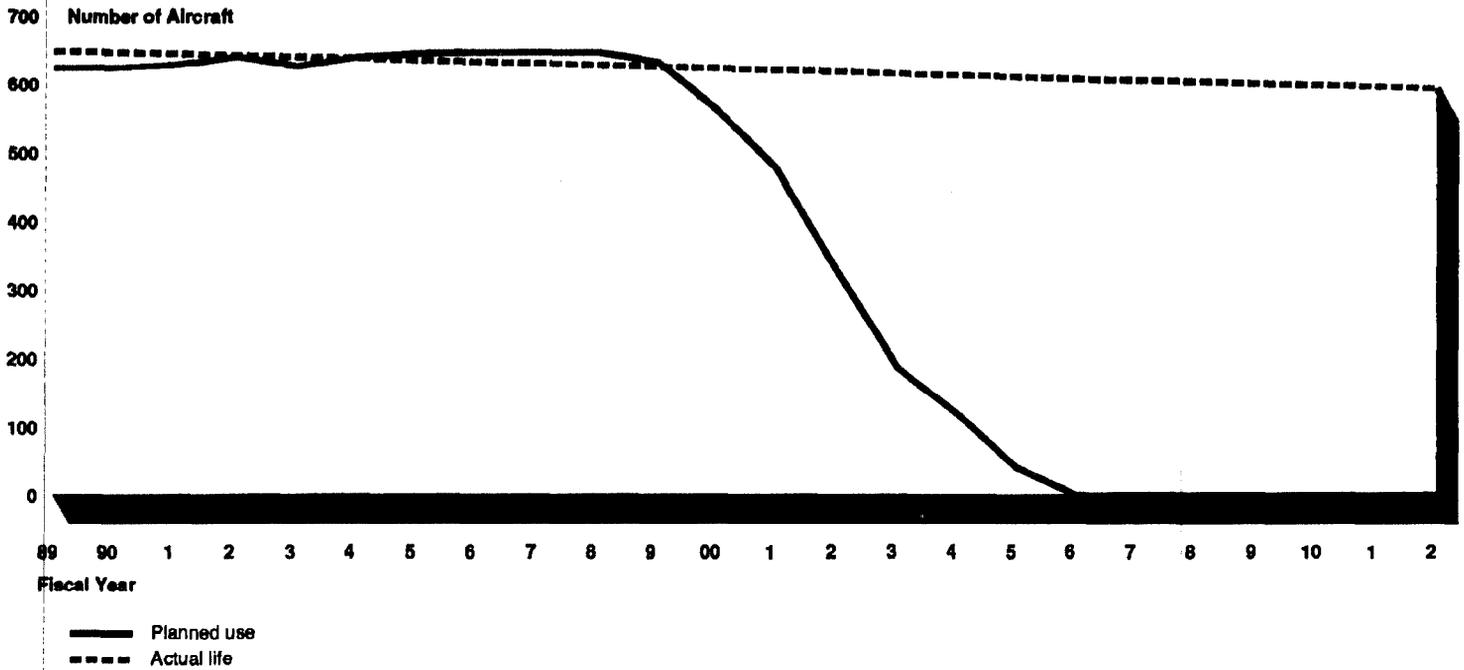
Soundness of Air Force Recommendation

The Air Force has initiated or plans to initiate extensive modification programs to its current fleet of T-37 and T-38 aircraft. When completed, these modifications will extend the useful life of the aircraft into the early 21st century. Thus, replacing the two aircraft as early as planned does not fully utilize the Air Force's existing fleet. It also increases near-term budgetary requirements at a time when the Congress and the administration are faced with the need to address the federal deficit. Delaying the acquisition of new aircraft for 5 years, for example, could reduce budget requirements during this period by about \$954 million, according to Air Force data. If the Air Force could increase its utilization rate for the T-38 aircraft, reduce its requirements for aircraft unavailable due to maintenance as it completes its T-38 modification program, and continue the low attrition rates it has experienced over the last 5 years, it could, if needed, increase its surge capability.

Air Force Plans to Replace T-37s

The Air Force plans to initiate a service life extension program for its 643 T-37 aircraft assigned to ATC at an estimated cost of \$197 million. The program, as described in the master plan, will consist of replacing six critical structural components that are not practical to inspect at field level, but it will not address the operational deficiencies identified in chapter 2. When the program is completed, the Air Force expects the T-37 to meet UPT requirements and remain airworthy past the turn of the century. Yet, because the Air Force believes it needs new aircraft to address the operational deficiencies of the T-37, it plans to buy about 100 aircraft to replace its T-37 fleet, beginning in 1998, well before the end of the T-37s flyable life (see fig. 4.1).

Figure 4.1: Comparison of Planned T-37 Utilization With Available Aircraft



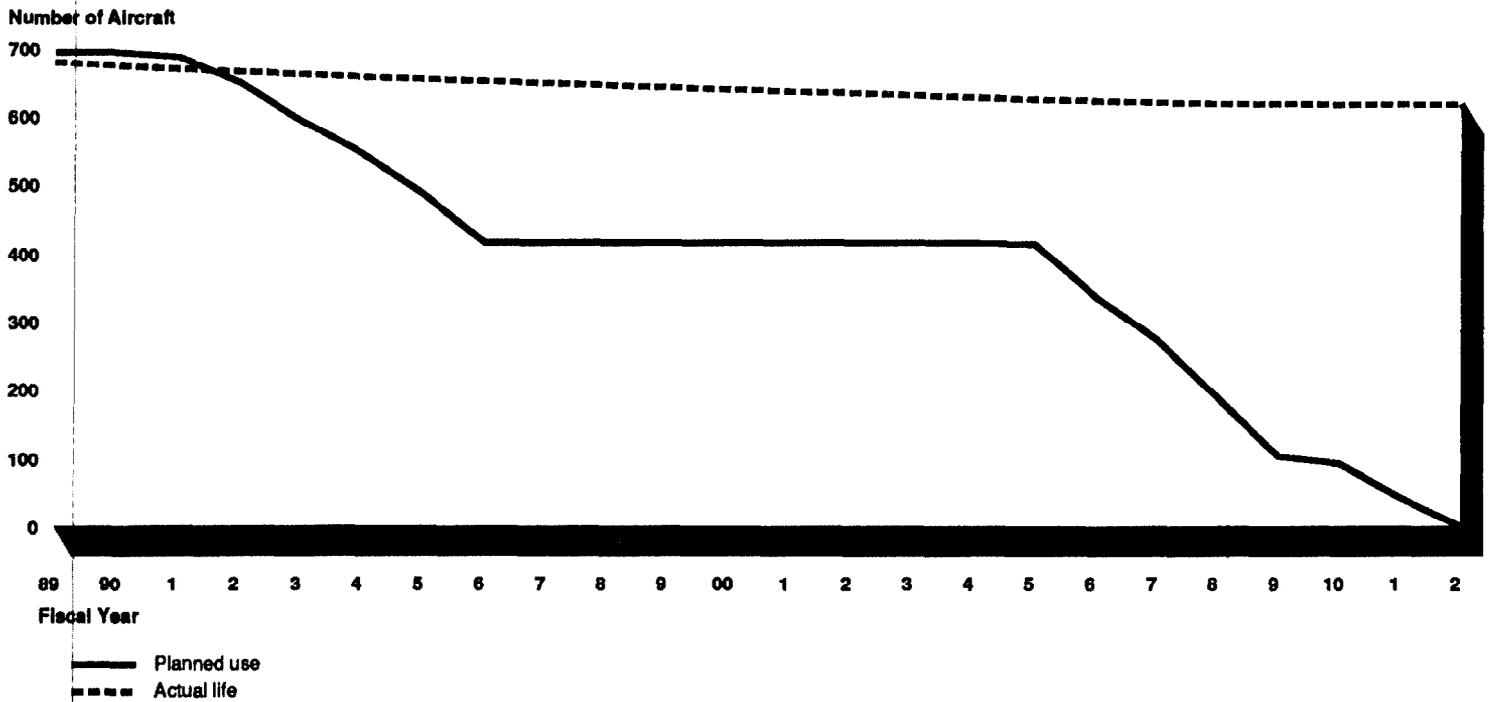
In its updated February 1989 master plan, DOD revised the scope of its T-37 modification program. According to DOD, rather than an increase of 15,000 hours estimated under the original modification program, the revised program would provide 8,000 hours of additional operation before a replacement aircraft or additional inspection is needed. According to the updated master plan, the next major inspection cycle after modification would occur in the 2005 to 2007 time frame. Thus, replacing the T-37, beginning in 1998, still does not fully utilize the aircraft.

Air Force Plans to Replace T-38s

In fiscal year 1986 the Air Force began a modification program to extend the useful life of its 679 T-38 aircraft assigned to ATC. The program, estimated to cost \$315 million, is a 10-year effort and consists of 7 structural modifications. According to the Air Force, once the modifications are complete, the T-38 will support pilot production, at current rates, until 1996, and over 600 aircraft are expected to be airworthy past the turn of the century. As with the T-37s, these modifications will not address the operational deficiencies identified in chapter 2. To

address the operational deficiencies and implement the dual-track system, the Air Force plans to buy about 200 new aircraft to replace some of its existing T-38 fleet, beginning in 1991, well before the end of its flyable life (see fig. 4.2).

Figure 4.2: Comparison of Planned T-38 Utilization With Available Aircraft



Other Improvements to the T-38

Over the years technological improvements to the T-38 have been incorporated. For example, the T-38 has had its navigational equipment and its UHF radio updated. According to ATC officials, the aircraft's avionics has also been upgraded and is being further upgraded as a part of the aircraft's current modification program.

Delaying New Acquisitions Could Reduce Near-Term Budget Requirements

If the Air Force delays its acquisition of new aircraft, it can more fully utilize its existing fleet and realize significant reductions in near-term budget requirements. For example, delaying the acquisition of new aircraft for 5 years, which is within the remaining flyable life of the existing aircraft, could reduce budget requirements over the next 5 years by about \$954 million, as shown in table 4.3.

Table 4.3: Potential Budget Reductions by Delaying New Acquisitions by 5 Years

In millions of then-year dollars

Type of cost	Fiscal year					Total
	1989	1990	1991	1992	1993	
New acquisitions	\$14.1 ^a	151.0	\$180.6	\$309.2	\$316.6	\$971.5
Operating & support	0	0	1.6	-2.0	-17.2	-17.6
Total	\$14.1	\$151.0	\$182.2	\$307.2	\$299.4	\$953.9

^aThis amount includes \$9.6 million to initiate acquisition of the first new aircraft.

Impact of Delaying New Acquisitions

According to ATC officials, delaying the acquisition of new aircraft would have an impact on the Air Force's ability (1) to meet its future pilot requirements and (2) ensure that its pilots are capable of meeting the increased demands of operating modern weapon systems. The Air Force anticipates a shortage of about 2,550 pilots by fiscal year 1993, if pilot requirements are not altered and pilot retention is not improved. According to Air Force officials, the Air Force has received congressional approval of a pilot bonus, which, if implemented, could alleviate an estimated 40 percent of its projected shortfall.

The Air Force believes that the long-term solution to its pilot shortfall depends partly on increased pilot production. Consequently, the Air Force believes it is prudent to ensure that its fleet of training aircraft is capable of responding to the potential for increasing pilot production by the mid-1990s.

While the Air Force believes that producing the required number of pilots is important, it also believes that training pilots to meet the increased demands of operating modern weapon systems must also be achieved. According to ATC officials, technological advances that have significantly expanded the combat capabilities of modern weapon systems have also placed increasing demands on the pilots who operate them. The implementation of SUPT, according to ATC officials, would vastly improve the quality of the student pilots' training.

DOD Comments and Our Analysis

DOD agreed that delaying the fleet replacement by 5 years would reduce near-term budget requirements by about \$954 million, but it added that the long-term impact would be unacceptable. It stated that delaying the start of the replacement program would (1) eliminate any flexibility to increase pilot production and (2) not be affordable as it would require the Air Force to start two major acquisition programs at the same time, thus requiring twice as much funding each year. It also noted that the fleet of T-38s continue to decline as aircraft are destroyed in accidents. DOD said that delaying the start of the trainer replacement program might also reduce the opportunities for joint procurement of trainer aircraft.

We recognize that delaying acquisition of new aircraft would reduce the extent to which the Air Force could increase its pilot production capability, if needed. However, after taking into account anticipated losses due to accidents, the existing fleet, when modified, should provide some surge capability for at least the next 8 years. Further, additional ways to increase surge capability may be available, which are discussed below.

We also recognize that delaying acquisitions may require the Air Force to start two trainer acquisition programs at or near the same time and that this could significantly increase the procurement funding requirements of the ATC during that period. However, Air Force-wide, it should not have as much of an impact.

Meeting Surge Requirements

The Air Force may be able to meet its surge objectives if it could (1) increase its utilization rate (UTE) for the T-38 aircraft, (2) reduce its requirements for backup aircraft authorization as it completes its T-38 modification program, and (3) continue the low attrition rates it has experienced over the last 5 years.

Increasing Utilization Rates

An aircraft's utilization rate represents the number of hours per month the aircraft is expected to fly and is a key factor in determining aircraft requirements. In the master plan, the Air Force used a UTE rate of 45.3 hours to arrive at T-38 requirements. However, prior Air Force and manufacturer studies have shown a theoretical UTE rate limit of up to 60 hours, and the Air Force actually experienced a 50.3-hour UTE rate period from fiscal years 1969 through 1973. An increase in the T-38 UTE rate would increase Air Force surge capability. Air Force personnel told us that an important factor in achieving maximum utilization rates for

its aircraft is to have sufficient spare parts. According to ATC officials, the Command has experienced a reduction in the availability of spare parts within the last year, which has had a direct effect on the availability of aircraft.

Reducing Backup Aircraft Authorization Requirements

Backup Aircraft Authorization (BAA) represents the aircraft not available for training due to depot-level maintenance. When the Air Force estimated T-38 aircraft requirements in the master plan, it used a BAA rate of 10 percent. For example, if the Air Force needed 100 aircraft for training, its requirement would be 110 (100 plus 10 BAA). The 10 percent used in this case may be too high, since the Air Force made no provision for BAA reduction when its modification program is completed or benefits from the maintenance tasks currently being performed in conjunction with the aircraft's modification. A reduction in BAA rate from 10 to 5 percent, which is the Air Force's estimate for each of the new aircraft in its master plan and the T-37 after modification, would reduce T-38 requirements and allow the Air Force increased surge capability.

Reducing Attrition Rate

Attrition rate reflects the number of aircraft lost due to accidents as a ratio of flying hours. The Air Force's master plan uses a rate of 1.4 aircraft per 100,000 hours for the T-38. Yet, over the last 5 years, the Air Force has experienced an attrition rate of 0.6 per 100,000 flying hours. If this rate can be maintained, more aircraft should be available to provide increased surge capability in an emergency situation.

DOD Comments and Our Analysis

DOD stated that the ATC has not experienced utilization rates on its T-38 aircraft above 43 hours per month since the early 1970s for a number of reasons. It also said that while it may be possible to increase utilization rates by modifying operational and logistics concepts, it is likely that aircraft losses would increase. DOD acknowledged that lowering the BAA rate for T-38 aircraft from 10 percent to 5 percent would provide some improvement in pilot production capacity, but this would not occur until the modification program is completed in the early 1990s.

We recognize that increasing the utilization rates for the T-38 may increase attrition, and we did not analyze the relationship. Our principal concern is that aircraft utilization rates may be too low because the ATC is not able to obtain the spare parts that it needs to properly maintain the existing fleet of aircraft. This would unnecessarily constrain the Air Force's surge capability.

Conclusions

For some time the Air Force has wanted to establish a dual-track system for UPT and have aircraft that are modern and more compatible with the types that UPT graduates will fly when they are assigned to their operational units. It also wants to increase its pilot production capability, if necessary.

The central issue of this report is one of difficult tradeoffs. Specifically, the question is whether the training and other benefits available by buying new aircraft at this time outweigh the near-term budget savings possible by delaying the program, which amount to almost \$1 billion over the next 5 years. To assist the Congress in its assessment of DOD's budget request, our report discusses the costs and benefits associated with the Air Force's plan to buy new aircraft at this time.

We recognize that delaying the acquisition of new aircraft at this time will delay the initiation of a dual-track system, which the Air Force has wanted for some time and Air Force studies have consistently supported. It would also limit the extent to which the Air Force can increase pilot production, if needed, although some surge capability is available with the current fleet of aircraft.

DOD Comments

DOD said that the Air Force considered alternatives of not buying new aircraft, but determined them not to be viable. While it acknowledges that its current fleet of trainer aircraft, when modified, will remain flyable at least to the turn of the century, DOD pointed out that there is an important distinction between "useful" and "flyable" as it pertains to trainer aircraft. To be useful, according to DOD, a trainer aircraft must possess four attributes: it must be safe, it must be representative of current operational systems, it must provide an effective training environment, and it must be economical to operate and maintain.

While DOD said that its existing fleet will remain airworthy, it believes that the other attributes justify the acquisition of new aircraft, as outlined in the Air Force's master plan. DOD also stated that delaying acquisition of new aircraft would eliminate the ability to increase pilot production, which it says is needed.

DOD did not agree with the recommendation in a draft of this report to reassess the need to replace the trainer aircraft as early as planned. In its updated master plan, DOD stated that the Air Force has an urgent requirement for a new trainer aircraft and recommended that the initial T-38 replacement proceed as planned. Since DOD's updated master plan,

**Chapter 5
Conclusions**

in effect, represents a reevaluation of the Air Force's original position, we have dropped our recommendation.

Comments From the Department of Defense

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



DIRECTOR OF DEFENSE RESEARCH AND ENGINEERING

WASHINGTON, DC 20301-3010

9 FEB 1989

Mr. Frank C. Conahan
Assistant Comptroller General
National Security and
International Affairs Division
US General Accounting Office
Washington, DC 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) Draft Report, "TRAINER AIRCRAFT: DoD Should Reassess Replacing Aircraft At This Time," Dated December 14, 1988 (GAO Code 392466), OSD Case 7864. The Department partially concurs with the GAO findings. The Department does not agree, however, with the GAO recommendation that the Secretary of Defense reassess the need to replace the Air Force trainer aircraft as early as planned.

The Air Force Trainer Master Plan, submitted to Congress in 1988, provides an affordable, carefully time phased approach for the acquisition of trainer assets to meet the requirements of the Air Force for Undergraduate Pilot Training over the next 20 years. To delay implementation of the master plan 5 years as suggested by the GAO would eliminate the ability to increase pilot production during this critical period for pilot retention, continue the heavy training load on the T-38 when the tanker-transport trainer would reduce the load, and would delay replacement of the T-37, which is reaching the end of its useful life as a training aircraft. In addition, the alternative of starting two major acquisition programs for training aircraft at the same time in the mid-1990s would not be affordable.

Detailed DoD comments on each finding and recommendation are provided in the enclosure. The Department appreciates the opportunity to comment on the draft report.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert C. Duncan".

Robert C. Duncan

Enclosure

GAO DRAFT REPORT - DATED DECEMBER 15, 1988
(GAO CODE 392466) OSD CASE 7864

"TRAINER AIRCRAFT: DOD SHOULD REASSESS REPLACING AIRCRAFT AT
THIS TIME"

DEPARTMENT OF DEFENSE COMMENTS

* * * * *

FINDINGS

FINDING A: Master Plan: Undergraduate Pilot Training. The GAO reported that, in April, the DOD submitted a report to the Congress containing a master plan for meeting the Air Force requirements for Undergraduate Pilot Training (UPT) into the early 21st century. According to the GAO, the report recommends that the Air Force modify its current training system for conducting UPT and acquire three new types of trainer aircraft, totaling 1,166 aircraft. The GAO observed that the cost of the program over 24 years is estimated at \$17.9 billion and includes \$6.9 billion (in 1987 dollars) to acquire the three new aircraft. The GAO reported that the master plan was approved by the Chief of Staff of the Air Force, the Secretary of the Air Force, and the Under Secretary of Defense for Acquisition. The GAO also reported that the conferees on the FY 1989 defense appropriations bill agreed to \$9.6 million for the Air Force to begin acquisition of the first of the three types of aircraft. The GAO noted, however, that the conferees also directed that the funds could not be obligated until the House and Senate Committees on Appropriations review the GAO assessment of the Air Force master plan. (pp. 1-2, p. 9/GAO Draft Report)

DOD Response: Concur.

FINDING B: Background: Undergraduate Pilot Training. The GAO reported that Undergraduate Pilot Training (UPT) is conducted in three stages, as follows:

- First, the students begin the introductory ground phase, lasting 3 weeks, in which the students receive physiological training, flight-related studies, and ejection seat/parachute training.
- Next, the students move to the primary training phase, lasting about 21 weeks, in which they receive fundamental flight instruction both in the classroom and in the T-37 trainer aircraft.

Now on pp. 2, 8.

- Last, the students move into an advanced phase, lasting about 28 weeks, in which the students receive additional academics and learn to fly the more advanced T-38 aircraft.

The GAO pointed out that, for the most part, under the current system all students receive the same training regardless of the aircraft they will ultimately fly when they are assigned to their operational units. According to the GAO, the Air Force is proposing to separate the current system into two specialized tracks, one for students who will eventually fly tanker or transport aircraft and the other for students who will eventually fly fighter or bomber aircraft. The GAO referenced the Air Force conclusion that students should receive specialized training during the advanced phase that is more compatible with the aircraft they will likely fly when assigned to their operational units. According to the GAO, it is the Air Force position that this dual-track system will provide a more highly trained graduate, who is better able to make the transition into follow-on aircraft, particularly for those graduates who will fly multiengine heavy aircraft, such as the C-5, C-141, or KC-10. (p. 2-3, pp. 10-13/GAO Draft Report).

DOD Response: Concur.

FINDING C: Alternatives Considered by the Air Force. The GAO observed that the Air Force considered four alternatives for meeting its future requirements for UPT. The GAO reported that the alternatives differed in how UPT would be met; however, each alternative assumed the following:

- programs to extend the life of its current fleet of T-37 and T-38 aircraft would be completed;
- the need to replace the existing fleet of T-37 and T-38 aircraft, beginning as early as 1990;
- an increase in pilot output capacity to 1,890 (which is about 10 percent above the current level of pilot output),
- an increase in flying hours per student from 81 to 89 for primary training and an increase from 109 hours to 119 hours for advanced training; and
- acquisition of new type aircraft would be spaced so that one type would be acquired at a time.

The GAO summarized alternative one, called Specialized Undergraduate Pilot Training (SUPT), as providing for separating UPT into two specialized tracks, one for students who will eventually fly tanker or transport aircraft and the other students who will eventually fly bomber or fighter aircraft. The GAO explained that this alternative provides for (1) replacing over 200 of the existing T-38 aircraft,

Now on pp. 2, 8.

Appendix I
Comments From the Department of Defense

beginning in fiscal year 1990, with a new modified commercially available business jet for use in the tanker/transport track, (2) replacing existing T-37 aircraft, in FY 1998, with another commercial aircraft for use by all students during the primary training phase, and (3) acquiring a third aircraft, beginning in FY 2002, to replace the remaining T-38s used for the bomber/fighter track.

The GAO described Alternative two, called Modernized Undergraduate Pilot Training (MUPT), as retaining the current single track, two-aircraft system and providing for replacing the T-38 beginning in fiscal year 1992 and the T-37 beginning in FY 1998.

The GAO described Alternative three, called All-Through Training System (ATTS), as retaining the single-track UPT system, but replacing the T-37 and T-38 aircraft, beginning in FY 1992, with a single aircraft that is capable of handling both the primary and advance phases of training.

The GAO described Alternative four, called Alternate Specialized Undergraduate Pilot Training (ASUPT), as providing for (1) moving to a dual track training program, (2) initiating the acquisition of a new aircraft for the tanker/transport track, as in alternative one, beginning in FY 1989, and (3) replacing the T-38 used for the bomber/fighter track and the T-37 used in the primary track with a single aircraft capable of handling both primary and bomber/fighter advanced track, beginning in FY 1998.

The GAO reported the Air Force concluded that alternative one (SUPT) provides the highest quality graduate for the lowest expenditure in procurement, operations, and support, and is expected to reduce the demand on the major commands for follow-on transition training to operational aircraft. (p. 3-4, pp. 14-16/GAO Draft Report)

DOD Response: Partially concur. In the SUPT alternative, the acquisition of tanker-transport trainer aircraft will reduce the demand on the T-38 fleet, but will not replace the T-38s on a one-for-one basis (over 200 aircraft). The exact number of T-38s needed to perform the advanced training mission in the bomber-fighter track of SUPT is still being analyzed.

FINDING D: Improving Quality of Pilot Training. The GAO reported it is the Air Force position that the dual-track system will provide a more highly trained graduate, who is better able to make the transition into follow-on aircraft, particularly for those who will fly multi-engine, heavy aircraft, such as the C-5, C-141, or KC-10. The GAO observed that, even though over one-half of the UPT graduates are eventually assigned to tanker or transport aircraft, they receive advanced UPT training in the T-38, which is a fighter-type airplane. The GAO noted that the dual-track system is expected to provide students who will eventually

Now on pp. 2, 11-12.

See p. 11.

fly multiengine aircraft with increased emphasis on those skills they need to make a more easy transition to the heavier aircraft. According to the GAO, the Air Force has reviewed the UPT mission several times in the past 17 years. The GAO pointed to several studies, which have concluded that a dual-track system would provide a more highly trained graduate than the current single-track system, particularly for those students who will eventually be assigned to the heavy, multi-crew, multiengine aircraft. However, the GAO pointed out that the current plans call for students who will be assigned to bomber aircraft to be in the same track as the fighter pilots and trained in the T-38 aircraft. The GAO concluded that this is a major change in philosophy from earlier plans, in which these future bomber students would be trained in the same track as future tanker and transport pilots. The GAO noted that the Air Force contends that students who will fly the new bomber aircraft, such as the B-2, will need many of the same skills as fighter pilots. (p. 3-4, pp. 17-18/GAO Draft Report)

Now on pp. 2, 13-14.

DOD Response: Concur.

FINDING E: Operational Deficiencies of Existing Aircraft.

The GAO observed that both the T-37 and T-38 aircraft were designed using technology from the 1950s and still operate with avionics and airframe systems reflecting the old aviation designs of that period. The GAO noted that, over the years, there have been improvements to the T-38 to incorporate technological improvements, but the Air Force still maintains that the existing T-37 and T-38 aircraft do not adequately prepare students for the operational environment of the future and the cockpits of more sophisticated and advanced aircraft. In addition, the GAO noted the Air Force position that the T-37 and T-38 have numerous operational deficiencies. The T-37, for example:

- has difficulty in operating the aircraft safely when one of its two engines fails;
- has limited ejection capabilities--its ejection capabilities are less than ideal at low speeds and altitudes;
- has excessive engine noise;
- has lack of a pressurized cockpit, which limits the altitude and usable airspace of the aircraft; and
- has limited range due to high fuel consumption.

The GAO also noted the Air Force position that the T-38 engine is susceptible to foreign object damage and is not able to operate in icing conditions. (p. 3-4, pp. 18-19/GAO Draft Report)

Now on p. 14.

DOD Response: Concur.

FINDING F: Increasing Pilot Capacity. The GAO observed that the master plan provides for the Air Training Command (ATC) to produce sufficient numbers of trained pilots to sustain the continuing needs of the Air Force operational forces. The GAO noted that, to ensure the ATC is able to meet all reasonable training contingencies, the Air Force proposes to buy sufficient aircraft for a maximum fixed-wing production capacity of 1,890 pilots at the five bases that conduct UPT. The GAO concluded that this production capability will enable the ATC to surge up to about 10 percent over current production goals.

In addition, the GAO stated that the Air Force is currently reviewing the analyses contained in the master plan to find out whether (1) the Air Force acquisition strategy can be reversed and the T-45 currently being procured by the Navy could be procured and (2) if the acquisition curve between the first aircraft buy and the second can be smoothed out to avoid the dip in budget requirements around 1997. The GAO also found that the T-37 modification cost may be revised to about one-half of the cost estimate presented in the master plan. The GAO concluded that a key assumption in the Air Force identification of alternatives is the need to begin replacing its existing fleet of T-37 and T-38 aircraft as early as FY 1990. According to the GAO, this assumption precludes considering an alternative of not buying any new aircraft until the current fleet approaches the end of its useful life. (p. 3-4, pp. 20-22/GAO Draft Report)

DOD Response: Partially concur. The Air Force has considered alternatives of not buying any new aircraft until the current fleet approaches the end of its "useful" life. However, these alternatives were determined not to be viable. The finding fails to consider the important difference between "useful" and "flyable" life as it pertains to trainer aircraft. To be useful, a trainer aircraft must possess four attributes:

- (1) it must be safe;
- (2) it must be representative of current operational systems;
- (3) it must provide an effective training environment; and
- (4) it must be economical to operate and maintain.

The first attribute, safety, really addresses the concept of flyability. The current fleet of trainers, T-37s and T-38s, are undergoing life-sustaining structural modifications which will insure they remain airworthy at least to the turn of the century. To address the remaining attributes, it is appropriate to consider each system separately.

Now on p. 15.

See pp. 15-16, 25-26.

The T-37 was introduced in 1956 and was representative of operational aircraft at that time. It operates today with a cockpit that has changed very little from its original design, in spite of dramatic improvements in display technology used in modern aircraft cockpits. Thus, many of the habit patterns formed in primary flying training do not apply to the weapon systems new Air Force pilots will fly. More importantly, skills that could be learned by the student at an early stage in training cannot be taught until more representative equipment is available. Finally, the age of the T-37 today and the basic technology of its engine design significantly limit its range and make it relatively inefficient to operate. The T-37 replacement aircraft is expected to save almost \$100.00 per flying hour in operating and support costs. Lifecycle savings will be substantial in a fleet that accumulates approximately 300,000 flying hours annually.

The T-38's basic instrumentation and cockpit environment are reasonably representative of today's bombers and fighters, except that it lacks some of the modern features, such as a Heads-Up Display and computerized navigation equipment, available in most new systems. As an advanced trainer, the T-38 falls far short of duplicating the tanker-transport environment. Despite these shortfalls, the T-38 will provide advanced bomber-fighter training well into the next century. In sixteen years, when the masterplan calls for its replacement, the fleet age will average 40 years and the aircraft will certainly lag behind new systems of the day.

It is true, under the SUPT option, some aircraft may be replaced while they are still airworthy. However, many of these aircraft will be approximately 50 years old at that time. From a DOD standpoint (as discussed above), it is highly questionable that either fleet, while possibly still flyable, will have residual utility as a trainer when it is replaced under current plans.

FINDING G: Uncertainty of Air Force Cost Estimates. The GAO found that the master plan shows an estimated acquisition cost of about \$3 million for the follow-on aircraft to the T-37. The GAO noted, however, that Air Force contacts with six manufacturers indicated a range of costs between \$1.8 million and \$5 million for each follow-on aircraft. The GAO further found that the Air Force fuel costs and maintenance manhours per flying hour for the T-38 replacement assumed a flat 30-percent improvement over current T-38 fuel consumption and a 25-percent improvement over current T-38 maintenance manhours per flying hour. The GAO concluded that, while the estimates may be reasonable, the fact that estimates were based on flat percentage improvements over existing aircraft illustrates the general nature of the cost analysis and its lack of preciseness. (p. 4-5, pp. 23-25/GAO Draft Report)

Now on pp. 3-4, 17-18.

See comment 1.

DOD Response: Partially concur. The DOD concurs with the variability of cost data relative to the T-37 replacement program, but questions its impact on the masterplan analysis. The two most expensive options considered, Alternate SUPT and the All-Through Trainer, did not use a T-37 replacement. In fact, the cost of the T-37 replacement could rise as high as \$6.4M per aircraft before the cost of the SUPT option approaches either of these higher-cost alternatives. Both SUPT and MUPT, the options closest to each other in terms of cost, called for the replacement of the T-37 at the same point in time. This generated identical T-37 replacement profiles and costs in both options. Since the critical measure of merit was the difference in cost between the competing alternatives, the variability of T-37 unit airframe cost had little impact on the overall cost analysis.

See p. 18

The second point of this finding questions the use of percentage improvement estimates in fuel costs and maintenance manhours per flying hour in the T-38 replacement program. Although percentage estimates are undoubtedly less accurate than actual data taken from existing systems, there are no existing systems to use as a baseline. This was the case with the bomber-fighter trainer that will replace the T-38. Percentage improvement values are frequently used in the design criteria for new systems, and this method is the accepted technique for projection of long-range requirements. Considering Air Force reliability and maintainability goals for future aircraft systems, these estimates are considered to be reasonable and are applied consistently throughout the analysis.

FINDING H: T-37 and T-38 Service Life Extension Programs.

The GAO reported that the Air Force plans to initiate a program to extend the useful life of its T-37 aircraft. According to the GAO, this program, as described in the master plan, will consist of replacing critical structural components. The GAO explained that, when completed, the Air Force expects the T-37 to meet its training requirements and remain airworthy past the turn of the century.

The GAO observed that in FY 1986, the Air Force began a 10-year modification program to extend the useful life of its T-38 aircraft. The GAO described the program as consisting of seven structural modifications. The GAO stated that the T-38, once modified is expected to support pilot production at current levels until 1996. The GAO explained that the Air Force expects that over 600 T-38 aircraft will be airworthy past the turn of the century.

The GAO concluded that, although the modification programs will extend the useful life of the existing aircraft, the Air Force plans to replace both aircraft well before the end of their useful life has been reached. (p. 5, pp. 26-29/GAO Draft Report)

Now on pp. 4, 19-21.

See p. 20.

DOD Response: Partially concur. The Air Force does not plan to replace the T-37 and T-38 well before the end of their useful life has been reached. As stated above, there are compelling reasons from a quality of training standpoint for replacing the current fleet according to the existing timetable. From the T-37 structural standpoint, the argument is equally compelling. At the time the 1988 Masterplan was being prepared, the T-37 Structural Life Extension Program (SLEP) was envisioned as a program which would add another 15,000 hours of service life to each aircraft modified. After the plan was submitted and during the time that the GAO audit was being conducted, the T-37 SLEP underwent a significant modification which reduced the scope of the proposed overhaul. It is now anticipated that the revised SLEP will provide approximately 8000 hours of additional operation before a replacement aircraft is required or another significant inspection must occur. The impact of this 8000 hour life extension is shown in Attachment 1.

At projected use rates, additional action or replacement is required by the year 2006. Attachment 2 depicts the rate of T-37 replacement deliveries compared with the projected rate of T-37 retirements. Replacement of the T-37 as outlined in the 1988 USAF Trainer Masterplan occurs just in advance of the anticipated loss of T-37 airworthiness.

FINDING I: Delaying New Acquisitions Could Reduce Near-term Budget Requirements. The GAO found that, if the Air Force delays its acquisition of new aircraft, it can more fully utilize its existing fleet of T-37s and T-38s and realize significant reductions in near-term budget requirements. For example, the GAO observed that delaying the acquisition of new aircraft for 5 years (which is within the remaining useful life of the existing aircraft) could reduce budget requirements over the next 5 years by about \$954 million. The GAO noted, however, Air Force officials contend that delaying the acquisition of new aircraft would have an impact on the Air Force ability (1) to meet its future pilot requirements and (2) to ensure that its pilots are capable of meeting the increased demands of operating modern weapons systems. The GAO observed that the Air Force anticipates a shortage of about 2,550 pilots by FY 1993, if pilot requirements are not altered and pilot retention is not improved. The GAO pointed out, however, that under Congressional direction, the Air Force is taking action to reduce its 23,000 pilot requirement and has received Congressional approval for a pilot bonus which, if implemented, could alleviate about 40 percent of the projected shortfall. According to the GAO, it is the Air Force position that the long-range solution to its pilot shortfall depends, in part, on increased pilot production. Consequently, the GAO pointed to the Air Force position that it is prudent to ensure its fleet of training aircraft is capable of responding to the potential for increasing pilot production by the mid-1990s. (p. 5, pp. 30-31/GAO Draft Report)

Now on pp. 3, 22.

See p. 23.

DOD Response: Partially concur. Although delaying the USAF trainer fleet replacement by five years would reduce near-term budget requirements by the stated amount, the long-term impact would be unacceptable. Delaying the start of the replacement program would eliminate any flexibility, which the Air Force needs to increase pilot production during a particularly critical period for pilot retention. Introducing the tanker-transport trainer into the Air Force fleet will reduce the training load on the T-38 and provide a 10 percent increase in pilot production capacity by 1995. At the same time, delaying a replacement for the T-37 is not prudent. As indicated above, replacement of the T-37 (or another significant inspection to a 50 year old fleet) is required beginning in approximately 2005, less than two years after its replacement is planned to be available. Additionally, the size of the T-38 fleet continues to decline as aircraft are destroyed in accidents. The alternative of delaying five years and then starting two major acquisition programs at the same time will require almost twice as much funding each year (see Attachment 3). The resulting fluctuation in funding and increased risk of integrating two new aircraft fleets at the same time pose a significant risk to the ability to continue producing Air Force pilots in sufficient numbers to meet anticipated requirements. The 1988 USAF Trainer Masterplan strategy was designed as a long range plan to reduce unnecessary funding fluctuations and reduce the operational risk associated with simultaneous acquisitions. In addition to the funding problem, any delay in the start of the trainer replacement program may reduce the opportunities for joint (Navy and Air Force) procurement of trainer aircraft.

FINDING J: Increased Surge Capability. The GAO found that, if the Air Force could (1) increase its utilization rate for the T-38 aircraft to a level experienced in earlier years, (2) reduce requirements for backup aircraft as it completes its T-38 modification program, and (3) continue the low attrition rates it has experienced over the last 5 years, it should achieve its desired surge capability. The GAO referenced ATC personnel statements that the Command has experienced a reduction in the availability of spare parts within the last year, which has had a direct effect on the availability of aircraft. (pp. 5-6, pp. 32-34/GAO Draft Report)

Now on pp. 4, 23-24.

See p. 24.

DOD Response: Partially concur. The Air Force Air Training Command has not experienced utilization rates on its T-38 aircraft above 43 hours per month since the early 1970s. There are a number of reasons for this decline. Most important is the fact that the operating environment has changed significantly. In the early 70s, the war in Vietnam required a substantial increase in the requirement for pilots. Production levels were approximately 50% above those of today. Additionally, there were nine training bases compared to the five which exist

Appendix I
Comments From the Department of Defense

today, and they all operated in a much less restrictive air traffic control environment. There was also a high price of increased attrition associated with the achievement of higher utilization rates and production levels -- aircraft losses rose to 16 in 1970. History has shown that T-38 losses due to accidents increase when fleets are pushed to achieve rates much above 44 hours. While it may be possible to increase the utilization rate by modifying operational and logistic concepts, it is likely that aircraft losses due to accidents would increase accordingly. It is acknowledged that lowering the BAA rate for T-38 aircraft from 10 percent to 5 percent would provide some improvement in production capacity. Unfortunately, this benefit would not occur until the Pacer Classic modification program is complete in 1996. The most critical period for the production of Air Force pilots is expected to occur in the early 1990s, prior to completion of Pacer Classic.

* * * * *

RECOMMENDATIONS

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense reassess the need to replace the Air Force trainer aircraft as early as planned. (p. 6, pp. 36/GAO Draft Report)

DOD Response: Nonconcur. It is the DOD position that replacement of the Air Force trainer aircraft should not be delayed. This recommendation assumes that Air Force pilot production will remain at or below FY 1988 levels for the next five years. Such an assumption is not valid, given the projected shortfalls in rated resources and the need for increased production. At the same time, attempting to achieve T-38 utilization rates, which were last demonstrated 15-20 years ago, increases the risk of additional aircraft attrition. Introducing the Tanker-Transport Training System (TTTS) into the Air Force fleet now will reduce the training load on the T-38 and produce a more highly trained graduate. The Air Force also faces a serious problem with its T-37 fleet. The anticipated reduction in flyable life for the T-37, along with its declining effectiveness as a trainer, makes its replacement a particularly important priority within DOD -- one that cannot be slipped beyond the current plan.

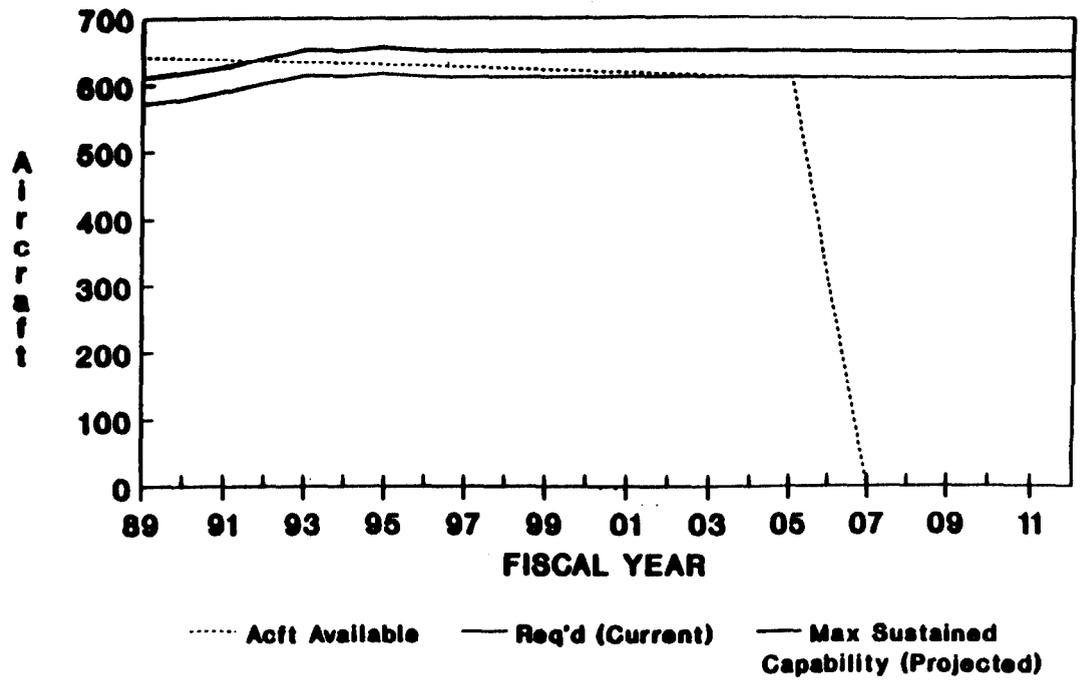
RECOMMENDATION 2: The GAO recommended that, if the Secretary decides to delay the acquisition of new aircraft, he fully support the logistical and maintenance needs (including spare parts) of the current T-37 and T-38 fleet to ensure they can be effectively operated until new aircraft are procured. (p. 6, pp. 36/GAO Draft Report)

DOD Response: Concur. In the event that this critical trainer replacement is delayed, logistical and maintenance needs of the T-37 and T-38 fleet must be fully supported. However, increased emphasis on trainer logistics support would necessarily occur at the expense of other Air Force requirements.

See comment 2.

See comment 2.

T-37 UPT REQUIREMENT With SLEP*

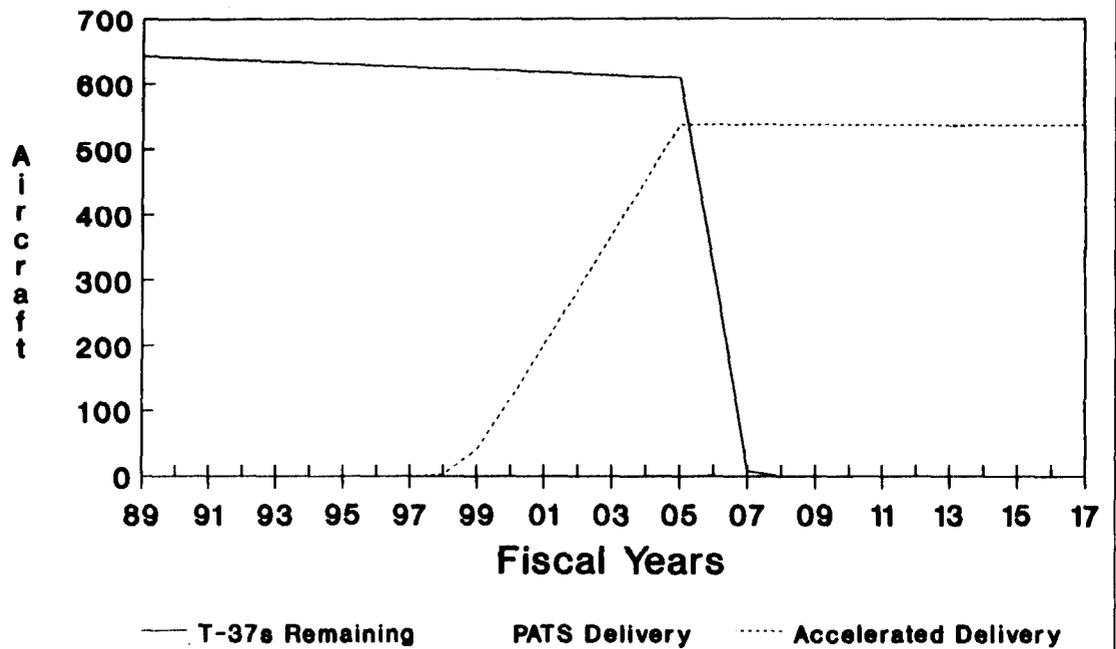


* Without Second SLEP in Early 21st Century

Attachment 1

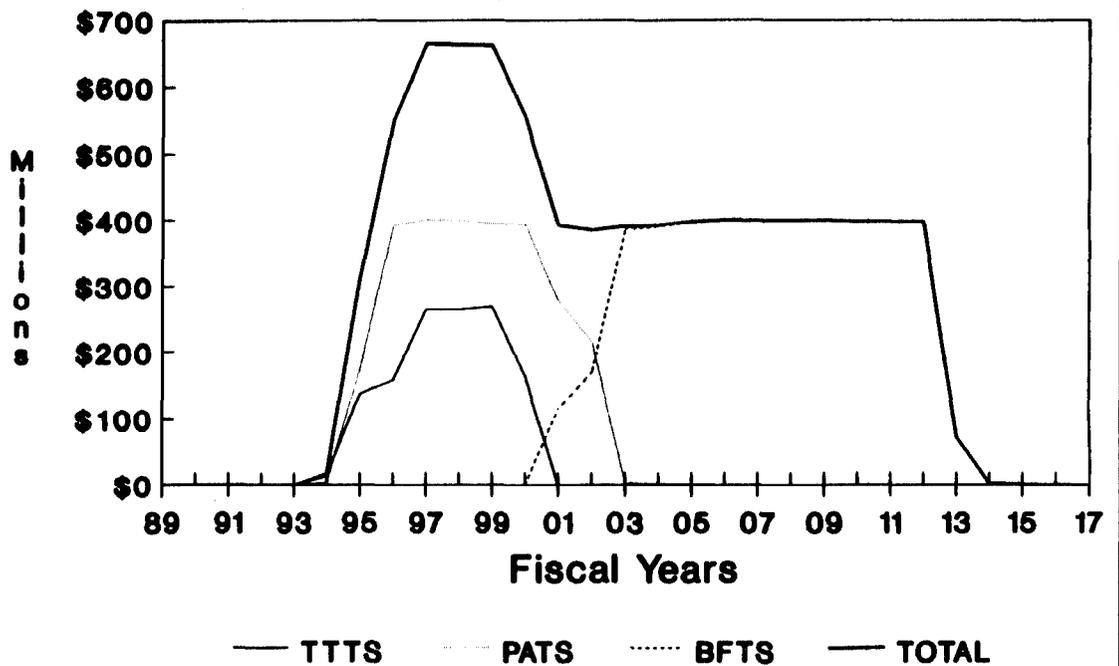
PATS DELIVERIES

T-37s Available vs PATS Deliveries



Attachment 2

SUPT FUNDING Delayed TTTS



CY87\$

Attachment 3

The following are GAO's comments on the Department of Defense letter dated February 9, 1989.

GAO Comments

1. We agree that variability in T-37 costs, since they apply to both options at the same point in time, would not make a difference in the comparative analysis of the two options closest to each other as they are considered in the master plan. We have deleted this example from the report.
2. On February 15, 1989, DOD issued an updated trainer aircraft master plan, in which DOD states that the Air Force has an urgent requirement for a new trainer aircraft and recommends that the initial T-38 replacement proceed as planned. Since DOD's updated master plan, in effect, represents a reevaluation of the Air Force's original position, we have dropped our recommendations.

Major Contributors to This Report

**National Security and
International Affairs
Division, Washington,
D.C.**

Paul L. Jones, Associate Director, Air Force Issues, (202) 275-4265
Charles W. Thompson, Assistant Director
Alfred L. Lilliendahl, Operations Research Analyst

Dallas Regional Office

Calvin E. Phillips, Regional Assignment Manager
Leonard E. Zapata, Evaluator-in-Charge
Deborah M. McQuiddy, Evaluator

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